M

DEVELOPMENT (1947-48) Department.

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Dated 26th July 1948

[Despatch Abstract.]

MISSION - Czechoslovakian Technical Mission - Visit to Madras - Conference at Ootacamund - Papers - Recorded.

IMMEDIATE.

No.I(3)-2(12)/47
Government of India,
Ministry of Industry & Supply,
Dated New Delhi, the 25th May 1948.

To

The Secretary to the Government of Madras,
Development Department, Madras.

Subject: Czechoslovakian Technical Mission.

Sir,

I am directed to say that a Czechoslovakian Technical Mission is touring India at the instance of the Government of India, studying the general industrial situation as well as particular industries with a view to determining how far its members can assist in the industrial development of this country. The Mission consists of nine members whose particulars are given below:

1) Mr. M.Rubeska, Leader of the Mission, Expert on Steam & Turbines.

2) Prof. J. Cermak, Expert on Boilers & Pulverised Coal Firing.

3) Dr. F. Jansa, Expert in Railway Electric Traction and fabrication of rail cars and coaches.

4) Dr. Vysoky, Expert in High Pressure Synthesis of Coal, and design of Chemical Plants.

5) Mr. J. Dvorak, Expert in Water Turbines & Water Power.

6) Mr. A. Julinek, Expert in Aircraft design and Manufacture.

7) Mr. C.Rajf, Expert in Armament design, manufacture & inspection.

8) Mr. K. Simovic, Expert in design and manufacture of Automobiles and Agricultural Machinery.

9) Mr. A. Faehnrich - Secretary of the Mission - Expert in Heat Economy and Thermal Power Stations.

It will be seen that the members of the Mission have made a special study of the following subjects:

1) Steam Turbines
2) Boilers & Pulverised Coal Firing
3) Electrical Traction
4) Water Turbines & Hydro Works
5) Aircraft
6) Heavy Chemicals
7) Automobiles and Agricultural Machinery.

2. The Mission has had several meeetings with certain Ministries at the Centre, e.g., WMP, Railways, Communications Transport, Commerce and Industry and Supply, and it has been advised to meet the Governments of the more important Provinces including Madras. A copy of the programme of Mission is enclosed. The Mission will reach Ooty from Calcutta on the 7th June 1948 and will stay there for

about a week. It is suggested that the Provincial Government may draw up a detailed programme in consultation with the Mission. This Ministry trusts that the Provincial Government will take full advantage xmf of the Mission's visit to this country.

3. It is requested that particulars of the officerx whom the Mission should contact immediately on arrival at Coty, may be communicated to this Ministry, preferably by telegram.

4. It will be greatly appreciated if you will kindly arrange for the residential accommodation for the Mission at Ooty.

I am etc.,

(B.B.Saksena)
for Secretary to the Government of India.

Copy forwarded to the D.G.(I&S) - Mr. Jangbir Singh with reference to the discussion between him and the under-signed this morning. A spare copy for the Secretary to the Mission is also attached.

ENGINEERING DEVELOPMENT DIVISION.

CZECHOSLOVAKIAN TECHNICAL MISSION
CONTINUATION PROGRAMME.

21.5.48 : 2.30 P.M. to 5.00 P.M. - Mission will visit C.W.I.N.C. Rai Bahadur Khosla and Mr. Man Singh will receive the Mission at CWINC offices in Curzon Road, New Delhi.

22.5.48 : 10.00 A.M. to 1.00 P.M. - Mission will conclude discussions with Supply Officers of D.G.I. & S., Shahjahan Road, New Delhi.

3.00 P.M. - Mr. Vysoky will call on Dr. Jeevaraj Mehta, Room No.89, North Block.

5.00 P.M. - Mission will leave Delhi by 'Plane for Agra to see the Taj Mahal.

23.5.48: Mission will return by 'Plane to Delhi'.

24.5.48 : 10.30 A.M. - Prof. Cermak and Mr. Vysoky will have discussions with Dr. J.N.Ray and Mr. Carvling of Messrs. Koppers in Dr. J.N.Rav's room. Block No.4. Shahjahan Road.

11.30 A.M. - Mission will meet Hon'ble Mr. Rafi Ahmed Kidwai in room No.171, North Block.

5.00 P.M. - Mission will meet the Hon'ble Minister, Works, Mines & Power, in Room 119, North Block.

9.00 P.M. - Mission will be guests of A.I.M.O. at Dinner at Imperial Hotel.

25.5.48 : 10.00 P.M. - Mission, except Mr. Julinek, will leave Delhi for Simla for rest and discussions with Electrical Commissioner.

26.5.48 : 8.30 A.M. - Mr. Julinek will visit the Tractor Repair Workshop of Ministry of Agriculture. Mr. P.L.Kumar will accompany Mr. Julinek.

27.5.48 : 7.00 A.M. - Mr. Julinek will leave Delhi for Bangalore; he will study Hindustan Aircraft Ltd., and visit Institute of Science and have discussions there during his stay. Mr. Julinek will leave Bangalore on or about 7.6.1948 for Ootacamund.

30.5.48 : Mission will leave Simla for Calcutta, and arrive at Calcutta.

(HALT AT CALCUTTA)

Detailed programme will be settled after Mission meets Bengal Government.

Programme will include discussions with Engineering Associations and a lecture or symposium with Institution of Engineers, India.

From Calcutta, Mission members will take short trip to Bihar to meet Bihar Government. Programme will include discussions with Messrs. TATA's Officers,

Inspection of "D" Class Cable Factory at Jamshedpur, visits to Collieries, Fuel Research Station and Damodar Valley.

7.6.48 : Mission will leave Calcutta for Ooty to meet Madras Government and Mr. S.A.Venkataraman, and have discussions with Hon. Ministers and Officers of Madras Government.

11.6.48 : Mission will leave Ooty for Bombay.

Detailed programme will be settled after Mission meets Bombay Government.

18-6.48 : Mission will assembly in Delhi.
(Detailed programme will be drawn up when Mission arrives in Delhi).

25-6-48 : Mission will leave for Czechoslovakia via Karachi.

Sd/- (Jang Bir Singh)
Deputy Director General (Development),
Engg. Division, D.G.I & S., New Delhi.

DISTRIBUTION:

Mr. Rubeska - 12 copies.
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All the three proposals have been approved and capital issue sanctioned. The names of the companies with other details of their proposals are given in the statement 'A'. This Province is in a specially favourable condition for the establishment of the industry first on account of its extensive coast-line facilitating the manufacture of salt, one of the main raw materials essential for the industry, and secondly in having extensive deposits of high grade limestone, another main essential raw material for the manufacture of Soda Ash.

Caustic Soda: Is one of the basic heavy, chemicals used in a number of industries. The present requirements of caustic soda for the whole of India have been estimated at 54,000 tons per annum, the quantities consumed by the different industries being as follows:-.

Soap	...	23,500 tons
Textiles	...	15,400 "
Paper	...	9,000 "
Oil Refining	...	
Vegetable ghee	etc.	6,000 mm

The Government of India Panel on Heavy Chemicals has estimated the future requirements of the country as follows:-

Soap	...	52,000 tons
Textiles	...	21,000 "
Paper	...	18,000 "
Oil Refining	...	12,000 "
Vegetable ghee		
Rayon	...	30,000 "
Total	...	1,33,000 tons.

The present production capacity for the whole of India is 12,600 tons of caustic soda per annum and for this Province 1600 tons per annum. The Mettur Chemical and Industrial Corporation Ltd., Mettur Dam which is the only firm manufacturing caustic soda in this Province at present propose to expand their production capacity from 1,600 tons to 4,800 tons per annum. The establishment of two new plants for the production of caustic soda in the Tinnevelly district has been approved by Government. A third plant in Nellore District for the production of caustic soda required for a Rayon Factory has also received the approval of Government. Statement gives the names of the firms concerned and the present position of their proposals. The aggregate production capacity of the three new plants together with the expanded Mettur plant will be 13,440 mm tons per annum. Another proposal from the Indian Chemicals Ltd., to establish a Caustic Soda plant in Vizagapatam district is now under consideration of the Government of India.

SULPHURIC ACID: Sulphuric Acid is another Heavy Chemical which finds extensive use in various industries. The consumption of Sulphuric Acid in India in 1944 and the targets recommended by the Heavy Chemicals Panel are as follows:-

NOTE FOR USE IN DISCUSSIONS WITH THE CZECHO-SLOVAKIAN TECHNICAL MISSION.

Out of the subjects in which the members of the Mission have made a special study, steam turbines, boilers and pulverised coal firing equipment, aircraft and automobiles are not items on the manufacture of which the Provincial Government are likely to embark, or private industrialists in Madras will be interested. Messrs Tatas have taken up the manufacture of boilers recently and it does not appear that there is scope, at present, for any other private industrial unit for the manufacture of boilers. The manufacture of aircraft has already been taken up by the Central Government and as regards automobiles some firms have already started assembly plants with the ultimate object of manufacturing all components themselves, in conjunction with British and American firms. Messrs. Ashok Motors propose to start a similar assembly plant for the production of Austin Motor cars in Madras. They will be assisted to commence production as early as possible.

If however, the Central Government are interested in promoting the manufacture of any of the items either by themselves or in conjunction with Provincial Governments and or private industry the Commission might be asked to advise on the possibilities of setting up such units. These projects will be very large ones and cannot possible be undertaken either by the Government of Madras alone or by private capitalists in the Province.

Electric Traction may be left out of account. As regards water turbines and hydro works, it is presumed that the Chief Engineer, Electricity, is preparing a note.

The material below relates to brief comments on the heavy chemicals, electro-chemicals, lignite, iron and steel, magnesite and agricultural machinery industries.

2. HEAVY CHEMICALS: Soda Ash.

Soda Ash is one of the most extensively used chemicals required by industries. The consumption of Soda Ash in various industries in India during 1944 is as follows:-

	Present consumption 1944. Tons.	Five year target. Tons.
Glass	25,000	50,000
Paper	12,000	24,000
Textiles	9,000	12,500
Dichromates	5,000	5,000
Sodium Silicate	3,500	3,500
Ordinance factories	3,000	3,000
Miscellaneous Chemical Industries	2,000	4,000
Washing and cleaning	48,000	70,000
For manufacturing manufacture of Caustic soda	Nil	95,000
	1,07,500	2,67,000

As against the present requirements of over one lakh tons and the target recommended by the Heavy Chemicals Panel of 2,70,000 tons, the production capacity of the soda Ash Plants existing in India at present is only 74,000 tons per annum, the actual production of Soda Ash being only half this. There is at present no factory producing Soda Ash in this Province but proposals have been received for the establishment of three plants -- two of capacity of 100 tons per day and the third of capacity of 150 tons per day.

and it may be worthwhile considering these two together in a proposal for setting up a manufacturing unit. As a matter of fact it might be desirable to watch and see how far imported machinery is in fact used by agriculturists, before taking up the question of manufacture in India.

5. LIGNITE:

It has been estimated that 498 millions tons of lignite with an average calorific value of 9,000 to 9,500 B.Th.U. can be exploited near Neyvelli in South Arcot Dist. Government propose to send samples of the lignite to America to test whether it is possible to make cooking coal from the South Arcot Lignite for utilisation in the steel industry. Utilization of lignite in place of coal may also involve special equipment for firing, special construction of the furnace, etc. It will be worthwhile consulting the Technical Mission and getting their advice in this matter. If our lignite can be used as a reducing agent, it might be quite possible to establish an iron and steel industry using Salem iron Ores.

6. IRON AND STEEL INDUSTRY:

The Ore deposits in Salem have been estimated at 304,650,000 tons within a depth of 100 ft. The ores are mainly magnetite interspersed with quartzite and the iron content averages 36 per cent. It has however been ascertained that the ores are amenable for concentration easily by magnetic methods to a grade containing over 55% iron. Three methods have been suggested for utilising the Salem Ore for production of pig iron and magnetite. The first method involves the use of charcoal as fuel in a blast furnace. The second method is based on electrical smelting in a shaft furnace using a smaller quantity of charcoal therein in the previous method. The third process suggested is stuerzelberg process by which sponge iron is produced by the reduction of the ore in a kiln type of furnace. Government are consulting Mr. Hagrupp Larssen, Technical Director of Electro-Kemisk, Oslo, Norway on the Salem Iron Ore. A detailed note on the subject is available in the Development Department and may be utilised.

7. MAGNESITE:

The utlisation of Salem Magnesite (the ore contains about 47% of Magnesia) for the production of Magnesium metal, Magnesite refractories, Sorel Cement, Magnesium Sulphate, etc. has been suggested Technical details of the plants required for these industries are lacking and some firms and specialists have been addressed for information. The Czechoslovak Technical Mission may be consulted with advantage for such information as they may be able to furnish.

	Present consumption (in tons)	Five year target.
1. Chemicals	21,000 tons.	35,000 tons
2. Fertilisers	20,000 "	63,000 "
3. Metals	3,995 "	7,000 "
4. Cotton Textiles	3,286 "	5,100 "
5. C.C.P.(S)	2,236 "	1,000 "
6. Mineral oil	1,611 "	2,000 "
7. Leather	790 "	1,000 "
8. Battery Acid	410 "	1,000 "
9. Distillery	318 "	1,000 ""
10. Miscellaneous	2,114 "	2,500 "
11. Rayon Industry	..	34,000 "
	55,760	1,52,600

The difficulty of transportation of the acid is a factor which favours the establishment of production units close to the consuming centres. The entire requirements of the country are being met at present by local production but there is considerable figures recommended. In this Province there is only one plant at present for the manufacture of sulphuric acid, namely, the factory at Ranipet belonging to Messrs. The East India Distilleries and Sugar Factories Ltd., This plant has a capacity to produce 4,100 tons of chamber acid per annum. Another plant for producing 80 tons of sulphuric acid per day using gypsum is proposed to be established by Sri Rama Chemicals, Ltd., in Nellore District. Government have also decided to permit the setting up in this Province of two factories for the production of Superphosphate each of a capacity of 50,000 tons per annum by Messrs. Parry & Company and Messrs. Shaw Wallace & Company. Each of these two plants when set up will include units for the production of sulphuric Acid of capacity of 50 tons per day. The total capacity of the existing and proposed plants will therefore come to 193 tons per day or 61,760 tons per annum, that is to say, over one third of the target fixed for the whole of India.

3. ELECTRO CHEMICAL INDUSTRIES: FUSED PHOSPHATIC FERTILISERS:

A proposal for the manufacture of fused phosphate with the aid of electric furnace has been received from Sri M.R. Narayana Swami. The plant proposed will have a capacity of 9,000 to 10,000 tons of phosphatic fertiliser using Trichy phosphatic nodules as raw material. Government have decided to give all reasonable assistance to this venture.

4. AGRICULTURAL MACHINERY:

There are no factories in this Province or in India for the manufacture of agricultural machinery as distinct from Agricultural implements. Messrs. P.S.G.Institute, Coimbatore, manufacture Threshing Machines which may be considered as agricultural machinery. Several Engineering Workshops in Coimbatore and in Madras have, started manufacturing pumping sets for well irrigation; but it is doubtful whether these can be considered as agricultural machinery. The manufacture of agricultural machinery such as Tractors, Harvestor Combines, etc., is very closely allied to the manufacture of automobiles

STATEMENT 'A'

S. No.	Name of Company.	Location.	Size.		Capital sanction.	Registration of Co.	Registration of capital goods for import.	Remarks.
1.	National Chemicals (Alkalies) Ltd. Masulipatam.	Guntur.	100 tons of soda Ash per day and also other minor soda compounds by products.	One crore and fifty lakhs (April 1947)	Sanctioned.	Not registered.	Registered but revised application made.	Await a decision by Government of Madras on their application for participation in the share capital of the company.
2.	Link Chemicals Ltd. C & Factors Ltd., Khaleeli Mansions, Mount Road, Madras.	Tinnevelly.	100 tons a day.	One crore (March 1947)	Sanctioned.	-do-	Registered but revised application made.	(2) Await a decision by Provincial Government on their application dated 18-4-47 for 25% participation in share capital and direction Government have apparently assured the company.
3.	South India Chemicals & Alkali Corporation Ltd., Sri S.S.Natarajan 2/21 First Line Beach	Factory to be located at Madura/ Ramnad.	150 tons per day.	Two Crores fifty lakhs (June 1947)	Sanctioned.			(3) Selection of site not completed Have applied for Mining leases for limestone, etc.

STATEMENT 'B'.

S. No	Name of Company or foundry.	Location.	Size.	Capital issue.	Import of Capital goods.	R E M A R K S.
1.	Southern Chemicals Limited.	Tinnevelly.	10 tons per day.	60,00,000 (Sixty lakhs) sanctioned.	Registration applied for recommended by Prov' cial Government.	200 acres of Land acquired. Mining lease applied.for.
2.	Heavy Chemicals Limited.	Tuticorin.	15 tons per day.	One crore sanctioned.	-do-	Fresh proposal.
3.	Rejah of Venkatagiri.	Nellore District.	2 tons per day.	60,00,000 (sixty lakhs) for Rayan plant.	Import licence granted.	Intended for Rayon plant.

OFFICE OF THE CHIEF ENGINEER FOR ELECTRICITY,
Chepauk, Madras, 12th June 1948.

My dear Sathianathan,

Czechoslovakian Technical Mission.

Further to my D.O. of the 9th instant, I met Dr. Jansa and Mr. C.Rejf of the above Mission here at the Connemara Hotel between 3 and 4.30 P.M. this afternoon.

A copy of the notes of discussion is herewith enclosed for the information of Government in your Department.

Yours sincerely,

Sd/- x x

W.R.S.Sathianathan Esq., I.C.S.,
Secretary to Government,
Development Department,
Madras.

The Madras Government Electricity Department is at present administering the following electric systems:-

I. Hydro-Electric.

	Total installed capacity.
(1) Pykara ...	48,430 KVA
(2) Mettur ...	50,000 KVA
(3) Papanasam ...	21,750 KVA
	1,20,180 KVA

II. Thermal.

	Total installed capacity.
(1) Vizagapatam (Steam) ..	3,750 KVA
(2) Bezwada (Steam) ..	6,000 KVA
(3) Cocanada (Oil) ..	710 KVA
(4) Kurnool (Oil) ..	340 KVA
(5) Madras (Steam) ..	55,875 KVA
	66,675 KVA

The total capital outlay on these systems amounts to Rs.10½ crores. At present 98% of the total power out-put in this Province is generated by the Government Electricity Department and the balance by a few licensees with Thermal plants. The three Hydro Electric Systems are inter-connected into a grid and work is now proceeding to link up the Madras City plant with Mettur and the Hydro-Electric System of the South.

2. The Government's Post-War Development Schemes are summarised below:--

(1) Machkund Hydro Electric Scheme:-- The power site is on the Madras-Orissa border and the scheme is to be executed in partnership with Orissa Government. The Madras share of the expenditure is about Rs.682 lakhs, including cost of connected schemes (namely, Bezwada-Rajahmundry-Samalkot extension, and Bezwada and Vizagapatam Plant extensions). The scheme is capable of ultimate development of 1,00,000 KW and is intended to benefit the Norther Districts.

(2) Ceded Districts Schemex:- Rs.50 lakhs - Hydro Electric Power (4,000 KW) is proposed to be purchased from Mysore Jog falls and distributed in Bellary and parts of Anantapur District. The agreement has been executed.

(3) Nellore Thermal scheme:- Rs.101 lakhs - capacity 8,000 KW. This is for the benefit of Nellore District. It will be linked up with Machkund on the north and with Madras and the Hydro electric ~~sxkxmx~~ systems of the South.

(4) Madras plant extension.- Rs.244 lakhs. One 15,000 KW generating set will be installed in 1949-50 at the Madras Power Station (existing plant capacity 55,875 KW) and two more 15,000 KW generating sets will be installed later. This will benefit Madras City and small extents of Chingleput District.

(5) Madras-Mettur inter-connection scheme - Rs.68 lakhs. This is to connect Madras with the Hydro electric systems of the South.

(6) Pykara Plant extension and Moyar Hydro Electric scheme -- Rs.414 lakhs - capacity 63,000 KW. This supplements the existing Pykara system. Construction is well in progress.

(7) Papanasam second stage extension including Madura Thermal scheme - Rs.127 lakhs - capacity 19,000 KW. This will almost complete the Papanasam Hydro-electric system.

(8) Miscellaneous extension lines such as Erode-Salem, Erode-Tricninopoly-Dalmiapuram, Madura-Thirumangalam-Rajapalayam, Tanjore-Mayavaram-Chidambaram, Papanasam-Tinnevelly-Kayattar, West Godavari-Nagamma-Pollachi and Gudivada-Pamarru-Vuyyur - cost Rs.220 lakhs. These lines are intended to convey the power developed into the depths of the country.

(9) Hindupur, Kollegal and Cuddapah distribution schemes -- Cost about Rs.20 lakhs. The existing licensed undertakings at the three places will be acquired and supply of electricity in the areas will be improved.

3. The ~~Rxxxx~~ Post War Development schemes mentioned above have all been sanctioned and execution is now progressing. With the completion of these schemes costing roughly Rs.20 crores almost every area in the Province will be served with electricity. Machinery has been

ordered for most of the schemes but ~~deliveries~~ deliveries are being delayed owing to the present international situation. The Czechoslovakian mission can help us by inducing their manufacturers to tender for the supply of machinery and materials. At present we are not having satisfactory response from that Country. The bulk of the materials are coming from U.K., U.S.A. and Switzerland.

4. Besides the Government Electricity Department, there are 75 licensed electrical undertakings who generate and supply power or distribute power supplied by the Government systems. Their total generating capacity is only about 2% of the Provincial out-put. There is a proposal to legislate for the acquisition of all these 75 undertakings. When this is done, the Madras Government Electricity Department will be responsible for the generation and distribution of all electricity in the Province.

5. The five year Post War Development Scheme is expected to be completed by 1953. The additional power generated under these schemes would not meet the rapidly increasing demand for electricity in the countryside. The Government are therefore investigating or propose to investigate the following new schemes:--

(1) Varahi river - South Kanara District.
(2) Lammasinghi falls in Vizagapatam District.
(3) Barapole river in Coorg.
(4) Thermal Power Stations at Cuddapah, Kurnool, Nandyal and Tadpatri.
(5) Tungabhadra and Ramapadasagar River irrigation schemes, which provide for Hydro-Electric Devt.
(6) Mekadatu Hydro-Electric scheme on Madras-Mysore border.

A Special Officer has been appointed to prospect the various Hydro-Electric resources in different parts of the Province and he is now compiling a long list of prospective schemes. Detailed plans and estimates have yet to be prepared.

6. The generating power plant requirements of the Madras Government Electricity Department during the next 5 years are indicated below:--

	1949 K.W.	1950 K.W.	1951 K.W.	1952. K.W.	1953 K.W.	Total. K.W.	Cost Rs. in lakhs.
(1) Boilers..	23,000	15,000	22,500	7,500	Nil.	68,000	169
(2) Steam turbines.	23,000	15,000	22,500	7,500	Nil.	68,000	55
(3) Water turbines.	50,600	25,000	61,000	Nil.	45,000	181,600	64

The above list is based on the Five Year Post War Development scheme. The mission may be requested to state whether any portion of this demand can be secured from Czechoslovakia through the good offices of the mission. Tenders for the supply of machinery and materials are published by the Electricity Department periodically.

7. Considerable difficulty is now being experienced in securing transmission line materials, insulators, transformers, meters and other electrical materials. One serious bottleneck in the development of rural loads is the supply of agricultural pumpsets. Since the price and cost of maintenance of bullocks

have increased considerably agriculturists are turning in large numbers to electric lifting. The mission may be requested to aid in the supply of these very essential materials.

PROCEEDINGS OF THE MEETING HELD ON THE 9TH & 10TH JUNE 1948 AT STONEHOUSE HILL, OOTACAMUND WITH THE CZECHOSLOVAKIAN TECHNICAL MISSION AT WHICH THE HON'BLE THE MINISTER FOR INDUSTRIES PRESIDED.

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Present.

1) Mr. M. Rubeska, Leader of the Mission, Expert on Steam Turbines.
2) Prof. J. Cermak, Expert on Boilers & Pulverised Coal Firing.
3) Dr. F.Jansa, Expert in Railway Electric Traction and Fabrication of rail cars and coaches.
4) Dr. Vysoky, Expert in High Pressure Synthesis of Coal and design of Chemical Plants.
5) Mr. J. Dvorak, Expert in Water Turbines & Water Power.
6) Mr. A. Julinek, Expert in Aircraft design and Manufacture.
7) Mr. C. Rajf, Expert in Armament design, manufacture and inspection.
8) Mr. K. Simovic, Expert in Design and manufacture of Automobiles and Agricultural Machinery.
9) Mr. A. Faehnrich - Secretary of the Mission - Expert in heat economy and Thermal Power Stations.
10) Hon'ble Sri H.Sitarama Reddy, Minister for Industries.
11) S.A.Venkataraman, Esq., C.I.E., I.C.S., Secretary to Government, Ministry of Industry and Supply, Government of India.
12) W.R.S.Sathianadhan, Esq., I.C.S., Secretary to Government, Development Department, Government of Madras.
13) T.M.S.Mani, Esq., O.B.E., I.C.S., Director of Industries and Commerce.
14) M.S.Sivaraman, Esq., I.C.S., Director of Agriculture.
15) Mr. B.M.Lakshmipathy, Joint Director of Agriculture.
16) H.K.Ghose, Esq., M.I.M.E., M.M.G.I., Officer-in-charge of Lignite Investigations, Government of Madras.
17) C.J.Venkataramana Rao, Assistant Secretary to Government.

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1. IRON & STEEL INDUSTRY:

Five possible methods of producing iron and steel were mentioned by the Mission. The first involved the use of charcoal for reduction of the ore and for heating. This involved the preparation of large quantities of charcoal from tiber but the collection of timber would be a colossal task. The Mission thought it would not be economical to make pig iron, using charcoal. The second method was to employ an electric furnace using charcoal only as a reducing agent. Sweden was adopting this method but the Mission felt that it would not be economical compared to the usual process of employing a blast furnace, with coking coal for reduction. Madras had no large surplus of hydro-electric power and even if such resources were developed it would be better utilised for other purposes than the production of steel, employing an electric furnace. The third method was the one employed by Kruppa for the production of sponge iron, using lignite. This process, however, involved putting the sponge iron again through the ordinary blast furnace, using coking coal for reduction. The Mission were not sure whether the technical personnel of Krupps who were familiar with the process could be easily traced. They undertook to try and obtain information

regarding their whereabouts and secure their advice. The fourth method was a French process (Basset process) to produce pig iron, and portland cement from the sludge, if the composition of the iron ore was favourable for the employment of their process. This process was being studied by the Czechoslovakians and a plant employing this method was in operation in Lisbon in Portugal. The Mission would be glad to get into contact with the French inventor or in the alternative the Government of India could do so themselves. Mr. Venkataraman, Secretary, Industry and Supply Department stated that he had a vague recollection that Basset had sold this process to others and that it would probably not be suitable for the Salem ore. In reply to a quarry, the Mission admitted that the plant working in Lisbon was a very small plant producing only 60,000 tons of pig iron. The fifth method was the usual method of using the ordinary blast furnace, metallurgical coal for coking and ordinary coal for heating purposes. The Mission were definitely of the view that it would be quite economical to use imported coking coal for reduction, using local coal for heating, even though coal had to be brought from a long distance. Sweden was doing so. In fact it might even be possible to use the South Arcot lignite for heating.

The Mission were definitely of opinion that the prospects of converting the South Arcot lignite into coking coal were extremely remote. Coking coal could not be produced from a variety of coal which does not coke. Briquetting of the lignite char would be impracticable; many persons had tried it and failed.

H.M. summed up the discussion and pointed out that apparently the only possible course was to consider the production of iron and steel from the Salem ore using imported metallurgical coal for coking and the South Arcot lignite for heating. The question of the plant and machinery required for such production would be taken up by the Industry and Supply department of the Central Government.

2. LIGNITE:

From the information placed before them, the Mission thought that the South Arcot lignite was somewhat similar to the coal in North Bohemia, but they felt that a more definite analysis was required before a decision could be reached on the possible ways in which the South Arcot Lignite could be utilised. They were not in a position to give any detailed advice regarding mining problems as they were not conversant with the subject, but they could see whether they could get the information required for and forward it. They would also send information about the availability of sand blowers and solid throwers required for the mining operations. They would meet Dr. Whitaker of the Fuel Research Station in Dhanbad and discuss with him what bye-products might be extracted from the lignite, but it was essential that a fuller sample should be analysed and investigated completely before anything further could be done.

As regards the possibility of producing motor benzol from the lignite by hydrogenation, the Mission were of the view that direct hydrogenation would not be possible

developed. With a large aircraft and motor car industry in prospect the scope for the use of magnesium metal would be appreciable. But its production would be profitable and it would therefore be necessary for the Government to produce the metal. He then referred to the possibility of adopting the direct process, called the Pidgeon process, of producing the metal by reduction.

Mr. Venkataraman pointed out that if the Government of Madras so desired, the Government of India would examine the question of producing the metal. Simultaneously, the production of Sorrel cement, refractories for the proposed iron and steel industry, and insulation material from magnesite could also be taken up. The Government of India might also examine the question of putting up a pilot plant in the first instance.

11. ALUMINIUM:

The Mission suggested that it might be economical to make aluminia in Madras using bauxite and sending the product to units which might be set up under the Damodar Valley and Kosi Projects of North India for conversion into aluminium metal. They recommended the installation of a pilot plant to see at what cost alumina could be produced, after first obtaining a detailed analyses of bulk samples.

12. POSSIBILITY OF UTILISING SMALL WATERFALLS FOR PRODUCTION OF SMALL QUANTITIES OF ELECTRIC ENERGY:

As such waterfalls occurred in rather remote localiti it was felt that there would be no point in pursuing the question of utilising small turbines for the generation of electri power for small scale industries, especially as transmission losses would be very heavy.

NOTES OF DISCUSSIONS WITH THE CZECHOSLOVAKIAN TECHNICAL MISSION BY THE CHIEF ENGINEER FOR ELECTRICITY ELECTRICITY.

Met Dr. Jansa and Mr. C.Rejf of the Mission between 3 and 4.30 P.M. to day (12-6-48). Dr. Jansa explained the purpose of their Mission and indicated that their basic industries had been nationalised and that they were all working under one roof under the name of "Czechoslovakian Metal and Engineering Works", and that they would be in a position to quote and supply in reasonable time the larger power plant that we might be requiring.

1. Major Projects: We discussed electrical development in this Province in general. Dr. Jansa desired that any enquiries and specifications that we issued be forwarded to their Agents in India, Messrs. Skoda Works, Ltd., Janmabhoomi Chambers, Fort St. Fort, Bombay - Telegraphic address: "Czechplant", Bombay. He desired in particular that their country should be given opportunity to quote for the Machkund Generating Units specifications for which were to issue shortly He also thought that they would be able to give attractive offers for the second 15,000 K.W. boiler and generating plant for Basin Bridge Power Station specifications for which were

under preparation. He suggested that pulverized fuel firing for the Basin Bridge Station appeared possible and desired a small sample of coal to be also sent to them.

2. We had been finding difficulty in getting suitable quotations for the spillway gates for the new Pykara Dam. Dr. Jansa said that if we indicated our requirements he might be able to send a quotation.

3. For the smaller boiler and generating units required for Madura, Kurnool and Cuddapah, of capacity less than 10,000 K.W. he said that they might not be able to offer attractive enough prices or deliveries.

4. Seasonal Power: The question of utilizing seasonal power for electro-chemical industries was discussed and their opinion was that it might not be economical to start such industries.

5. Lignite: Dr. Jansa said he would send me particulars about the use of lignite in large power stations and the special process by which lignite was powdered and fed into the boilers and the ash drawn in liquid from therefrom. These would be of use in the design of the Power House in the Vridhachalam area when lignite extraction is pronounced economically feasible.

6. Rural Electrification: Dr. Jansa would send me literature on their "Nautillus" submersible pumpsets for use for lift irrigation. I asked in particular for literature on pumpsets of capacities varying from 5 to 10 H.P. Czechoslovakia would be unable to send us any cheap tubular poles nor G.I. pipes for lift irrigation.

7. Basic Power Plant Manufacture in India: I understood that this question had already been mooted at Delhi and that the Mission would be again meeting the Ministries of "Works, Mines & Power" and "Industries and Supplies" on this question. From the discussion I had I am not sure if this Mission would be able to help us except in a small way and for a few items of the basic industry we contemplate. The Mission seemed more anxious to sell us such machinery as they make rather than help us to make such machinery here.

Development Department.

A.S.

Relevant extracts of the proceedings of the discussion with the Czechoslovakian Technical Mission were already given to the sections and Departments concerned for further action. There is no action pending in this file. The papers may be recorded.

GOVERNMENT OF MADRAS.

Abstract.

MISSION - Czechoslovakian Technical Mission - Visit to Madras - Conference at Ootacamund - Papers Recorded.

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DEVELOPMENT DEPARTMENT.

G.O.Ms.No.3950. Dated 28th July 1948.

ORDER:

RECORDED.

S. Jayaraman 11/3/54.

OFFICE ASSISTANT,
MADRAS RECORD OFFICE.

KRVD.20.1.

8/10/54.

but tar could be produced first and then subjected to hydrogenation. The French and Germans were experts in this process. The Mission also pointed out that bitumen and tar from lignite would be definitely inferior to bitumen, petroleum asphalt and tar derived from the oil-fields. Mr. Venkataraman, Secretary, Industry and Supply Department pointed out that if bulk samples were analysed, the French and German experts whom the Government of India were obtaining could look into the matter.

The Mission (and particularly Dr. Vysoky) pointed out that no mention had been made regarding how the Ammonia required for the Ammonium Sulphate industry was proposed to be produced. He felt that lignite could be easily used for the production of the ammonia required for the manufacture of the fertiliser, if the analysis of the bulk samples of the lignite indicated that it would lend itself to easy gasification, and synthetic gas, and ultimately ammonia, could be manufactured.

3. ALUMINIUM:

While the Mission saw no reason why the Indian bauxite which was of a high purity could not be used to produce aluminium, they felt that a 5000-ton unit, would not be economical. It would be futile to contemplate the production of aluminium unless extremely cheap electric power could be produced. Mr. Venkataraman pointed out that it was not a question of producing electric power and then finding some use for it, but on the contrary it was essential to investigate and put into execution schemes for the production of plenty of cheap hydro-electric power to be ear-marked for the aluminium industry. India was likely to need, in the future, several times the quantity of aluminium now consumed.

It was agreed that the question of producing cheap hydro-electric power should be discussed first and that there would be no use in examining the possibility of producing aluminium without first having provided for such power.

4. CAUSTIC SODA AND SODA ASH:

The Mission pointed out that it would be out of the question to contemplate the Solway process, as it was less economical and more messy. The major problem in the caustic soda and soda ash industry was the disposal of the free chlorine which would be liberated under the electrolytic process. A proportion of the chlorine could be utilised for the production of bleaching powder and a part could be utilised for public health purposes and the manufacture of hydro-chloric acid for reducing bones. But this would still leave a very large quantity of chlorine which could not be utilised. It would be futile to contemplate any large scale production of caustic soda and soda ash unless the unit was balanced like the I.C.I. units, capable of supplying only the right quantity of caustic soda, soda ash and free chlorine that could be fully utilised. It therefore followed that it would not be possible for India to have any large scale plants for the production of caustic soda and soda ash.

Plant for the production of soda ash and caustic soda was not readily available in Czechoslovakia. They could however, supply small plants for the production of soda ash and caustic soda.

5. AGRICULTURAL MACHINERY:

The Director and the Joint Director of Agriculture pointed out that there was no scope in the Province for the use of large scale tractors but smaller multipurpose types useful for agriculture, haulage, production of power etc., could be utilised. No survey had been made of the expected demand for small and medium tractors and other agricultural machinery but it was estimated that the demand would be in the neighbourhood of 1000 such tractors per annum. Mr. Venkataraman pointed out that the Central Government were examining the question of establishing a central factory to produce annually 10000 tractors. The Director and Joint Director of Agriculture agreed that such a plant would be able to supply the requirements of Madras.

The question of utilising the technical assistance of the Czechoslovakian Technical Mission in connection with the Central Government scheme was being discussed by the Central Government with the Mission. The Government of India were also taking up the question of producing internal combustion engines both for tractors and agricultural machinery and also for other purposes.

6. LEATHER INDUSTRY:

The members of the Mission had no knowledge of leather machinery but the Mission said that they would write for and obtain information if necessary.

7. CEMENT AND PAPER PLANT:

As regards Cement plants, the Mission said that no plant would be available readily in Czechoslovakia. They promised to make enquiries and let the Government know whether they could deliver paper plants which could be employed for the production of paper, utilising bamboos and other soft wood.

8. TRAINING TECHNICAL PERSONNEL IN SPECIAL INSTITUTES:

Mr. Venkataraman stated that the question of training Indian personnel in special industries in Czechoslovakia was being taken up by the Central Government.

9. FERTILIZERS:

The C.T.Mission suggested that instead of contemplating the production of Ammonium Sulphate and Super Phosphates, which are normally used together, Ammonium Phosphate might be produced direct as it combines both the essential ingredients, nitrogen and phosphorous. Such production would be easy with lignite and phosphatic nodules available in the South Arcot and Tribhinopoly districts.

It was agreed that samples of phosphatic nodules would be sent to the Mission along with samples of the lignite.

10. MAGNESIUM:

Dr. Pandya (General Manager, Hindustan Aircraft Factory), who was present, pointed out that the demand for magnesium metal in present conditions was small because the production of light alloys was not well